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SETTING UP A GREEN FUEL MOISTURE STUDY

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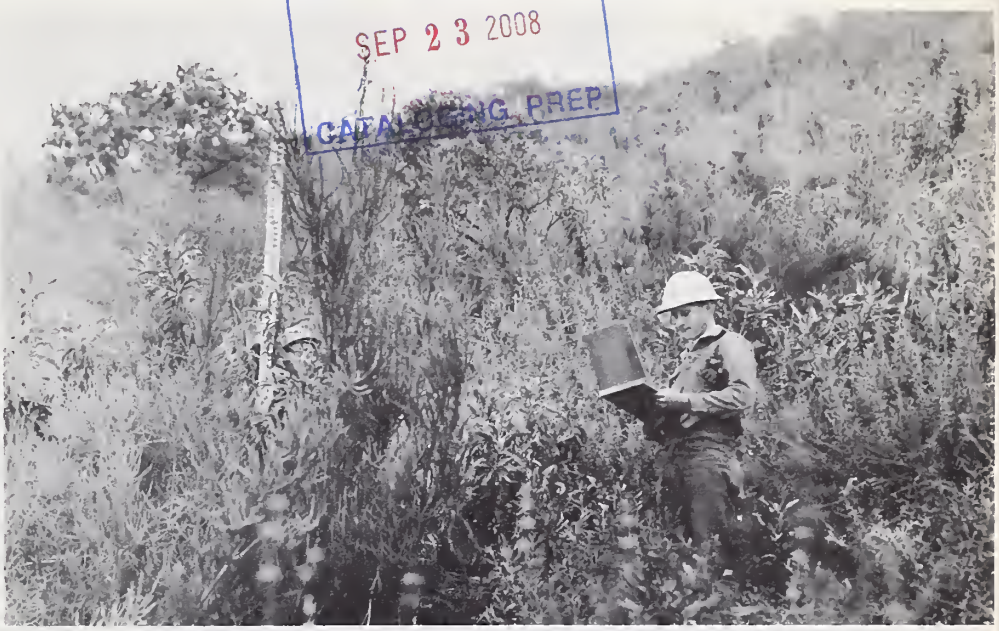

In November 1958 Fuel-Break[1/] workers began studies of the moisture content of green chaparral fuel. Since then study plots have been established and described, and instruments obtained and installed. In March of 1959 actual data collection began. This report tells what has been done to set this project up so as to get the needed information on green fuel moisture.

Why is green fuel moisture content important? Among fuel characteristics affecting fire behavior, moisture content is probably most critical. Green fuel moisture may be a key to some possible fire resistant plants, hence its value in the Fuel-Break program. It is an element of fire danger rating, hence more precise knowledge is needed.

Green fuel moisture is affected by climatic variables, but it is not known how and to what degree. Our objective is to be able to predict moisture content at any specific time by knowing the weather history.

1/ FUEL-BREAK--aimed at breaking up continuous brushfields for better fire control--is a joint research, pilot-plant, and administrative action program of the California State Division of Forestry, Los Angeles County Fire Department, and the U. S. Forest Service.

To meet this objective, we decided to establish permanent sample plots in several fuel types. Each plot would be equipped to measure continuously and record automatically all the weather variables that might be correlated with changes in green fuel moisture.

Since south aspects have fuel conditions that pose the toughest fire control problems, studies were started there. It was decided to sample chamise-sage and chamise-chaparral fuel types. The actual plots selected are located at the San Dimas Experimental Forest, Bell watersheds, elevation 3, 100 feet.

A necessary first step was to describe the experimental areas fully.

Species composition, dead fuel content, and total fuel weights were noted - - and litter depth was recorded. Soils were studied and described.

Weather stations were installed for each plot.

To record wind direction and speed, anemometer, wind vane, and operations recorder were set up.

To record temperature and relative humidity, a hygrothermograph is used.

Soil moisture is measured with the nuclear probe--a new device with a radioactive element for sensing moisture.

Standard 100-gram fuel sticks are attached to a recorder to keep track of the moisture content of 1/2-inch sticks.

To provide a record of green fuel moisture, foliage of chaparral is collected in flasks once a week.

The flasks are taken to the lab and water is collected by the xylene distillation process. Water content of the chaparral is computed from this information.

For the analysis of results, data from weather recorders, soil moisture readings, and green fuel moisture content determinations are tabulated and presented graphically. These relationships will be further studied by use of high speed computer. All data are punched on IBM cards for rapid analysis.

Green fuel moisture trends are entered on graphs such as the one shown to the right, which reports some preliminary results from a 1959 study. Complete results of all the fuel studies will be presented in a technical report in early 1960.